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A research program on teaching instrumental music tested the value of concept learning for beginning band pupils for the first 12 weeks of their instruction. Eighteen randomly selected schools from Montana, Colorado, and Wyoming provided fifth-grade students (9 control classes and 9 experimental classes) who met in classes of 18 pupils for two 50-minute periods per week for 12 weeks. Seven basic music concepts (e.g., physical design of the instrument, ideal tone quality, correct note length, rhythm) were developed and taught. Students were evaluated by the "Watkins-Farnum Performance Scale" and the Colwell "Elementary Music Achievement Test." An analysis of the data indicated that the concept approach to teaching beginning band pupils was (1) superior to traditional methods for teaching students to perform on woodwinds, upper brass, and drums, (2) especially effective in teaching students with high or average music ability and students with low or average IQ's, (3) as effective as traditional teaching methods for developing aural-discrimination skills, (4) equally effective with boys and girls, and (5) superior to present teaching methods in developing performance skills for all pupils. (LH)

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A STUDY OF THE EFFECTS OF A CONCEPT TEACHING CURRICULUM ON ACHIEVEMENT IN PERFORMANCE IN ELEMENTARY SCHOOL BEGINNING BANDS

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U.S. DEPARTMENT OF HEALTH,
EDUCATION, AND WELFARE

OFFICE OF EDUCATION
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The research reported herein was performed pursuant to a small Contracts Grant with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U.S. DEPARTMENT OF HEALTH,
EDUCATION, AND WELFARE

Office of Education
Bureau of Research

CONTENTS

SUMMARY

In spite of better materials, teachers, and instruments on which to learn, the processes by which instrumental music is taught to children have not changed materially in the last half-century. The class system of teaching this discipline has been taught largely through the processes of group tutoring. It has been a system of teaching specifics, almost exclusively by rote, rather than using underlying concepts involving relationship and problem-solving. The present methodology has resulted in laboriously slow skill-building and in numerous drop-outs.

The problem and objectives of the study. This research was aimed at discovering through experimental methods the values of concept approaches developed by the investigator to teaching beginning-band pupils during the first 12 weeks of their instruction. The objectives were: (1) to discover if a concept approach results in greater achievement in performance and understanding, (2) to discover if a concept approach results in greater achievement on any one instrument in this group, (3) to discover if a concept approach results in greater achievement in beginning band performance for the target population by each one-third of the sample on two pre-experimental measurements of musical aptitude and achievement, (4) to discover if a concept approach results in greater achievement in beginning band performance for the target population by each one-third of the sample on a pre-experimental measurement of native intelligence, and (5) to discover if a concept approach results in greater achievement in listening skills for the target population.

Related literature indicated that the concept approach with inductive learning has had heavy emphasis in mathematics, science, and social studies, although research has not shown a significant advantage for either inductive or deductive learning.

Seven null hypotheses directly relating to the objectives given were formulated.

Research design. Three levels of the Posttest Only Control Group Design were used in each of the states of Montana, Colorado, and Wyoming. Two schools from each level from each of the three states were selected through a table of random numbers, making a total of 18 schools. Through

toss of a coin, 9 were placed in control classes and 9 in experimental. All schools used the same instruction book, met for two 50-minute periods per week, were made up of fifth-grade pupils with approximately 18 pupils in each class, and were randomly assigned to the class by the teacher. No pupil was to have prior band training on his instrument nor was to take private lessons during the 12-week experimental period. Each class met for 12 weeks, or a total of 1200 minutes, after which two posttest instruments, the Watkins-Farnum Performance Scale and the Colwell Elementary Music Achievement Test were given. Five blocking variables were established and the dependent variables were scores achieved on the posttest instruments. One factor was introduced as the experimental treatment: the basic concept was taught prior to any specifics or skills which were elements of the concept. Seven of these concepts were developed, with concomitant understandings, generalizability to new learnings, and introductory locations in the instruction book, by the Investigator. Because of the strong effect of variability in teacher effectiveness on the research, the Evaluation of Teacher Ability developed by Granville B. Johnson was used for analysis of this variable.

Analysis. Analysis of pupils (N=253) showed them to be approximately normal for instrumental beginners in I.Q., musical aptitude, and in musical achievement. The analysis of teachers in teaching effectiveness showed an r=.964 coefficient with pupil outcomes on the Watkins-Farnum posttest measure. The seven hypotheses were tested through analysis of variance, t tests, or covariance (as applicable to each hypothesis) by means of data processing. Appropriate factors in the first hypothesis were compared with outcomes on the measure of teacher effectiveness.

Conclusions. Eight conclusions appeared warranted following completion of the research. These were:

1. The concept approach to teaching beginning band pupils is superior to present teaching methods in the development of performance skills, for all pupils taken as a whole.

2. The concept approach is superior for teaching upper woodwinds, upper brass, and drums. Both approaches are equal for teaching low woodwinds and low brass.

3. The concept approach is equally effective for boys and for girls.

4. Pupils high and average in musical aptitude will gain more in performance skill through concept approaches than through traditional teaching methods.

The converse is true for pupils low in musical aptitude.

5. Pupils high and average in prior musical achievement gain more in performance skill through concept approaches than through traditional teaching. The converse is true for pupils low in prior musical achievement.

6. Pupils high in measured I.Q. gain more in performance skill through traditional methods than through concept teaching. Pupils average and low in I.Q. gain more through concept teaching.

7. Both approaches are equal in development of aural-discrimination skills.

8. Because of the normal distribution of pupils on pertinent characteristics and the high correlation of teacher effectiveness to learning outcomes, the Investigator concluded that the results of this study can be generalized to American fifth-grade beginning band classes in other schools with similar population characteristics.

ACKNOWLEDGMENTS

The Investigator would like to acknowledge the assistance of the 18 cooperating teachers who did the direct teaching in this research. All of them are, among other duties for each, elementary school instrumental music teachers in their respective school systems. None had ever participated in experimental research prior to this Project, but each responded with enthusiasm and an apparent high degree of objectivity.

These teachers were: Mr. William Avery, Coffeen School, Sheridan, Wyoming; Mr. Robert Bares, Graff School, Laurel, Montana; Mr. Kent Brandebery, Wilcox School, Castle Rock, Colorado; Mr. Austin Cass, Plummer School, Idaho Springs, Colorado; Mr. Herbert Cleary, East School, Littleton, Colorado; Mr. Charles Cornwall, Elementary School, Lingle, Wyoming; Mr. William Gamble, Elementary School, Walden, Colorado; Mr. Erin Goosey, Elementary School, Superior, Montana; Miss Maxine Hoyme, Breeze School, Craig, Colorado; Mr. James Irons, Highland Park School, Lewistown, Montana; Mr. Roy Lyman, Russell School, Missoula, Montana; Mr. Joel Monson, North Grade School, Douglas, Wyoming; Mr. Joe Rulli, University School, Laramie, Wyoming; Mr. Jack Sharpe, Bain School, Cheyenne, Wyoming; Mr. Robert Singer, Elementary School, Fort Benton, Montana; Mr. Keith Simpson, Spangler School, Longmont, Colorado; Mr. Joel M. Story, Highland School, Billings, Montana; Mr. Cleo Wheeland, Elementary School, Chugwater, Wyoming.

CHAPTER I

INTRODUCTION

In spite of numerous new teaching materials, better-trained teachers, and good-quality instruments on which to learn, the processes involved in teaching instrumental music to children have not changed significantly in the past half-century. While the disciplines of mathematics, science, and social studies in particular have had their teaching methodology almost entirely reorganized in recent years, teachers of instrumental music, through the class system of teaching, have largely adapted the processes of private tutoring to group situations. The system has been one of teaching specifics, almost exclusively by rote, rather than the utilization of underlying concepts, whereby children learn by relationships and problem-solving. This has resulted because instrumental learning has involved aural and visual recognition in addition to a mechanical skill-building. Students are taught, for example to: "push down the second valve for F#" and "hold a half note for two counts," commonly in exclusion of any relationship of such specifics to basic, overall concepts. True, many good teachers attempt to teach some concepts, such as the relationship of one key signature to another or one dynamic level to another. The present methodology, however, has resulted in laboriously slow skill-building which is commonly unrelated to musical understanding and in numerous drop-outs from school bands and orchestras because pupils are unable to see the major goals of their musical learning.

Concept approaches may result in: (1) associations of one learning to another so that all make some cohesive whole, (2) making the learning of instrumental music more meaningful to the student through problem-solving, (3) reduction in time for the teacher so that he is not constantly teaching and re-teaching specifics, and (4) provision of greater carry-over values from instrumental training into adult life.

The problem of the research. As a specific portion of the problem, this research was aimed at discovering through experimental methods the values of concept approaches developed by the investigator to teaching instrumental music to beginners during the first 12 weeks of their instruction. The following assumptions were proposed: (1) Music is an integral part of the life of man: music appreciation and

understanding are results of musical learning; musical learning can best be taught by experiencing and "doing" music. (2) Instrumental music is one medium of musical learning; like other media of music, it has its own body of literature, understandings, and concepts. (3) The elements of musical knowledge can be taught. (4) Certain underlying principles of instrumental performance can be taught as concepts.

Objectives of the study. The objectives of the research were as follows: (1) to discover if a concept approach results in greater achievement in performance and understanding by elementary school band beginners, (2) to discover if a concept approach results in greater achievement on any one instrument in this group, (3) to discover if a concept approach results in greater achievement in beginning band performance for the target population by each one-third of the sample on two pre-experimental measurements of musical aptitude and achievement, (4) to discover if a concept approach results in greater achievement in beginning band performance for the target population by each one-third of the sample on a pre-experimental measurement of native intelligence, and (5) to discover if a concept approach results in greater achievement in listening skills for the target population.

Review of literature and related research. Controlled, scientific research on the learning processes involved in instrumental music is practically non-existent. Most of the available literature seems to reflect opinions of writers rather than the results of real research. The prevailing method of teaching instrumental beginners (9:150) has been one in which the parts (the skills) of music must be learned before the whole (the concept) may be seen. Commonly, the pupil is left to find the concept for himself.

The term concept has been used extensively in education writing and research the past few years. Womack (14:30) characterized a concept as having both a denotive and a connotive level of meaning. He described the denotive level as simply a dictionary definition of the concept itself and the connotive as the process of developing concept-formation through introducing students to concepts over long periods of time in varied settings so that the student will discover for himself the diverse connotations of the concept. The term, then, refers to a word or phrase whose real meaning can only be thoroughly understood through knowledge of its constituent parts and from which the student can make predictions about phenomena which are new to him. According to Klausmeier (7:1), possessing a concept enables the individual to categorize objects and events as belonging to the same class or not; in turn, it renders the environment less complex.

A generalization is an aim of a unit of study. Usually, it is a sentence or a paragraph from which a concept is derived.

The "new" mathematics, science, and social studies have depended heavily on inductive reasoning as the basis for discovering generalizations and concepts. It is a mental skill (14:10) wherein a pupil sees a specific number of parts, events, or phenomena and reasons that each of them falls into a pattern based on some criterion such as size or shape. Inductive reasoning, then, becomes the basis for problem-solving. Deductive reasoning, on the other hand, is the time-honored approach in which the pupil is introduced first to the concept and from it deduces the specifics, or component parts.

Much of the research in concept learning has been done under existing Federal programs. Evidently no firm evidence is available as to whether the inductive or deductive approach is of greater value. Smith and Others (10:93) found some evidence to support a deductive sequence and some to support the inductive. They reported that other researchers found both equally effective. While no evidence has been found that the concept itself is not of value in teaching, the significant aspects of different methods (10:108) of teaching these concepts have yet to be discovered. Klausmeier (7:110), however, found that when information about a strategy (the concept itself) was introduced first, learning was the most efficient and that when prior information was minimal, learning was least effective. Amster (1:79) learned that concept-formation works better for junior-high and high-school pupils than for elementary. She determined that associative processes (concepts arrived at on the basis of associations to present exemplars of a concept) were more effective for fifth-grade pupils than the inductive process of concept-formation. In spite of numerous strengths of inductive reasoning and concept-formation, they have a weakness in that the desired concept may not be the outgrowth of the generalization and that an incorrect concept may be formed. Womack (14:10) warned that the concept: ". . . has the defect of a perceived pattern of events holding true to form."

Most incredibly, there has been no large-scale research on the real values of the "new" mathematics and science. The BSCS biological science approach (5:7-8), initiated in 1959 by the American Institute of Biological Sciences, and the PSSC physical sciences, started in 1956 at Massachusetts Institute of Technology, were organized around basic concepts and provided for study in depth of these concepts. The emphasis (8:33) was on conceptualization rather than memorization. The fundamental principle is the instillation of concepts in learners, arrived at through discovery, and the application of these concepts to specific problems.

The application to the social studies is a comparatively recent development. Cottle (4:79) reported that the Project Social Studies started in 1963 under the direction of the U.S. Office of Education, emphasized planning and investigating in the application of social-studies concepts for a period of five years. Evaluations of this project were to begin in 1968. Currently, the total methodology of social studies, K-12, is being revised to one similar to those of methematics and science.

Music teachers seem to be aware of the possibilities of improving their programs through emphasis on concept approaches. In a recent article, Thompson (11:45) deplored the present methodology, indicating that many teachers of school performing groups rely on the "osmosis" theory of instruction. One learns merely by a "soaking-up" process with the faith that sooner or later the learner begins to "know." This method, he said, would arch the eyebrows of teachers in other academic disciplines in a shock of disbelief. Primarily, instrumental music teaching is a process of inculcation of specifics in a step-by-step order. One cannot "know" until he can "do." He must learn the "mediators" before he can form the concepts.

Limitations of the study. The following were limitations placed on this research: (1) only one factor was introduced as the experimental treatment; seven basic concepts were taught prior to any specifics or skills which were elements of each concept, (2) results of the research were limited in applicability to fifth-grade beginning band pupils, (3) the experimental period was limited to 12 weeks of instruction, and (4) actual measured differences in learning by both experimental and control groups was limited to the validity for this particular experiment of the pre and posttest instruments.

Hypotheses of the research. Six null hypotheses concerning outcomes of the research were stipulated in the original proposal: a seventh was proposed and approved early in the experimental period. The seven were:

1. There will be no significant differences between the grand means of the experimental and control groups on the Watkins-Farnum Performance Scale posttest scores. (Alpha level .05)

2. There will be no significant differences between the grand means of the Watkins-Farnum Performance Scale posttest scores of the experimental and control groups for each type of instrument. (Alpha level .05)

3. There will be no significant differences between the grand means of the Watkins-Farnum Performance Scale

posttest scores for each sex within the experimental and control groups. (Alpha level .05)

4. There will be no significant differences between the grand means of differences between the means of the Musical Aptitude Profile scores and their corresponding Watkins-Farnum Performance Scale posttest scores for the lower, middle, and upper 1/3 Musical Aptitude Profile scores of the experimental and control groups. (Alpha level .05)

5. There will be no significant differences between the grand means of differences between means of the Elementary Music Achievement Test pretest scores and their corresponding Watkins-Farnum Performance Scale posttest scores for the lower, middle, and upper 1/3 of the experimental and control groups. (Alpha level .05)

6. There will be no significant differences between the grand means of differences between means of the I.Q. scores and their corresponding Watkins-Farnum Performance Scale posttest scores for the lower, middle, and upper 1/3 I.Q. scores of the experimental and control groups. (Alpha level .05)

7. There will be no significant differences between the grand mean gains of the experimental and control groups on the pre and posttest administrations of the Elementary Music Achievement Test. (Alpha level .05)

Significance of the research. Since the Investigator found no evidence of previous research on the use of concepts in elementary instrumental music, and since mathematics, science, and social studies have made such extensive applications of concepts as central in their course structures, the results of this study appeared to be of utmost value in music education. Significant results should result in large-scale adoption.

CHAPTER II

THE DESIGN OF THE RESEARCH

The experimental factor in this study was the introduction of seven concepts during the experimental period; these concepts were introduced prior to the actual constituent learning experiences; the factor emphasized a combination of inductive-deductive reasoning from the content.

For the experiment, three levels of the Posttest Only Control Group Design (2:24-5) were employed in each of the three Rocky Mountain States of Montana, Colorado, and Wyoming. The Posttest Only design was chosen, without pretest as a fundamental part of the design, because pupils in a beginning band class will all start at a theoretical point 0. Pupils, however, vary in musical aptitude and in extent of prior knowledge of music through experiences in general music classes and through private study on piano. Therefore, as indices (pre-experimental) of aptitude and achievement, two tests were administered to all participants: the Gordon Musical Aptitude Profile and the Colwell Elementary Music Achievement Tests. These two were chosen because of their high coefficients of validity (r=.79 for the Gordon test and r=.92 for the Colwell) and reliability (r=.94 for the Gordon and r=.94 for the Colwell). In addition, the I.Q. scores, from the school records, were used as a third indice.

Because the size of the pupil population in the school might affect the resultant musical learning of pupils, three levels of total school size (1-12) were randomly sampled in each state of the target population; which sizes were determined arbitrarily by the State Department of Education in each of the three states. Although some differences existed in the classification among the three, those differences did not appear significant. The means of the three state classifications were: large, 1333 and over; medium 317 to 1333; and small, 316 and fewer pupils.

Two schools from each level (or classification) from each of the three states were selected through a table of random numbers for inclusion in this research. Of the resultant first total of 18 schools, 14 of the chosen schools did not agree, for varying reasons, to become a part of the experiment; consequently, use of the table of random numbers was repeated until the necessary 18 of the correct size and

state had assented to inclusion. Through toss of a coin, one of each two was placed in the experimental group and the other in the control. Selected in the experimental group from Montana were: Missoula (large), Lewistown (medium), and Superior (small). From Wyoming were: Sheridan (large), University School (medium), and Lingle (small). In Colorado were: Littleton (large), Castle Rock (medium), and Idaho Springs (small). Selected in the control group from Montana were: Billings (large), Laurel (medium), and Fort Benton (small). From Wyoming in the control schools were: Cheyenne (large), Douglas (medium), and Chugwater (small). From Colorado in this group were selected: Longmont (large), Craig (medium), and Walden (small). Consequently, there were a total of 18 schools, 9 each in the control and experimental groups, all nested in the three classifications of large, medium, and small schools. There was one elementary school beginning class in each community chosen by the instrumental music teacher of that school system (except in the larger systems where the choice of both teacher and school was made by the superviser of music.)

Constants. All schools used the Fred Weber First Division Band Course, Book 1 (this book was chosen because it is one of the most commonly used books in American schools); the experimental period was for 12 weeks; each class met for two 50-minute periods per week and was made up of fifth-graders; and each teacher was asked to have approximately 16 pupils in each class. (Fifth-graders were chosen because this is the most common starting grade; the number 16 was chosen because it is representative of a normal beginning class size). The instrument on which each pupil started was not to be specified by the Investigator; approximately half of the pupils in each class were to be girls and half boys (assignment to each specific class was to be done randomly by the teacher); no pupil selected was to have had prior band training on that particular instrument; no pupil was to take private lessons on that instrument during the class lessons; and, since methodology and techniques were not to be specified for the control groups, the procedures were adjudged as a constant for these groups. Since assignment of pupils to these classes was to be done arbitrarily within random selection, normal school scheduling of them was difficult or impossible. Thus, each class often met outside of normal school hours. Since the project, then, required extra time, a stipend for each cooperating teacher was necessary.

Time sequence. The entire study was planned for the period September 1, 1968, to February 1, 1969. The weekend of September 14-15, 1968, all participating teachers, from both the experimental and control schools, came to the campus of the University of Wyoming for an intensive review of procedures, activities, and essential restrictions to be used

during the experimental period. The pre-experimental indices were administered during the last two weeks in September by the individual teachers. Actual classes started during the week of September 30 to October 4, 1968. (One, however, did not begin until October 15). Each proceeded for 12 weeks for a total of 1200 minutes of class instruction, closing, for most schools, the week ending December 20. The two posttests were administered the last day of each class.

Posttest instruments. For the posttest, the Watkins-Farnum Performance Scale and a second administration of the Colwell Elementary Music Achievement Test were given. The Watkins-Farnum test is the only known standardized test of music performance. To measure growth in listening skills, the Colwell test was given again. (It would have been preferable to have given alternate forms of the Colwell, but forms A and B of this test are non-equivalent).

Variables with limited controls. Each of these variables, for which limited control was available, could seriously affect the outcome of the research: (1) teaching effectiveness of individual teachers, (2) motivation of pupils and strengths and weaknesses of the total individual school music programs, and (3) the financial wealth of individuals and school districts, affecting the quality of rehearsal facilities and quality of instruments played. The latter two variables tended to equalize through random selection of schools and pupils. Because of the strong effect of individual teacher effectiveness, a rating scale by Dr. Granville B. Johnson, Jr., entitled Evaluation of Teacher Ability (for sample and permission acknowledgment see APPENDIX pp. 34-36) was used in each of three visits to each class.

Independent, blocking variables. Five blocking variables were established, and they were: (1) scores achieved on the Musical Aptitude Profile, (2) scores achieved on the pretest Elementary Music Achievement Tests, (3) sex, (4) instrument played, and (5) I.Q. scores.

Dependent variables. Of primary importance were scores achieved on the Watkins-Farnum Performance Scale. Although this test was developed to provide scores in terms of letter grades, for the purpose of this experiment, the actual raw scores were used instead. Of secondary importance were gain scores between the first and second administrations of the Elementary Music Achievement Test.

Experimental factor. As stated previously, only one factor was introduced as the experimental treatment; the basic concept was taught prior to any specifics or skills which were elements of the concept. No specific fingering, rhythm, note value, or pitch was to be taught in isolation

for its first introduction. Although there are many more which make up total performance and musical understanding, seven were developed to be utilized in the 12 weeks. These seven concepts, their concomitant understandings, their expected generalizability (as used in this experiment, generalizability referred to usability in new learnings), and their introductory locations appear on pages 10-2.

The following were further requirements to the teacher for instillation of the concept:

(a) The overtone series for brass instruments, the register interval for woodwinds, the three basic rudiments for percussion, the valve system for brasses, and the chromatic system of sharping natural pitches on woodwinds must be known to the pupil before he learns any specific fingerings. The fingering charts and the individual fingering introductions in the text are to be torn out or covered so that each child must determine for himself a correct fingering.

(b) The physical attributes of tone production were to be taught as an interrelated whole.

(c) Tape recordings of all basic beginning instruments performing standard American folk songs familiar to the pupils were made by the University of Wyoming music faculty. In addition to their initial introduction, the tapes were played periodically during the experimental period as reinforcement was needed.

(d) At least once in each rehearsal, some diatonic intervals were to be sung and then played, beginning with seconds, then thirds, fourths, sixths, fifths, octaves, and sevenths, in that order.

(e) The concept of mathematical relationship of note values were shown the group by teacher illustration of whole-, half-, quarter-, and eighth-note values. As each new meter signature was encountered, the class was asked to determine note values from that signature.

(f) While both factors making up rhythm could be stressed independently, their interdependence was also to be emphasized.

(g) The concept of phrasing was demonstrated by the teacher a number of times prior to playing of page 6, number 4, by the pupils and during the 12 weeks as reinforcement.

	Concept	Understandings (in the vocabulary of the teacher)	Generalizability	Introductory Location in First Division
1.	Physical design of the instrument[a]	The resultant pitch of any note on a band instrument is a result of the fingering principles of the instrument and its overtone series. They will vary with each instrument.	The application to each pitch new to the student on that instrument.	Introduction immediately following p. 4. Omit pp. 2 and 5.
2.	Tone production[b]	Correct reed placement, good embouchure, adequate breath-control, correct holding position are all essential parts of correct tone production, not isolated habits.	Good tone production is essential to development of good tone quality.	Prior to p. 6, number 1, and periodically through the 12 weeks as reinforcement is needed.
3.	Ideal tone quality[c]	The ideal tone quality is a mental image of the sound the pupil is attempting to achieve. Its attainment is based on the focus of the factors in tone production toward that image.	The concept of tone quality can and must be generalized to each succeeding musical rendition. The child will not attain an ideal tone quality immediately; it is a gradually developing process.	Prior to p. 6, number 1.

	Concept	Understandings (in the vocabulary of the teacher)	Generalizability	Introductory Location in First Division
4.	Intervallic relationships[d]	The "distance" from one pitch to another is not only a matter of "up" or "down" but also of "how far." It can best be learned by the relationship of one "distance" to another. It is a process of both auditory and visual recognition, and is thus a skill as well as an understanding.	Recognition of these relationships can be generalized as both a specific and as a concept to each new interval encountered.	Introduction p. 6, number 3. Succeeding examples: p. 7, number 7; p. 8, number 2; p. 9, number 4; p. 13, number 6; p. 17, number 5.
5.	Correct note length[e]	Duration of notation is a mathematical proportion based on the divisor of the meter signature. The emphasis is on <u>proportional</u> value.	The concept of correct note length through proportional value can be generalized to every new piece of music, the note values of which must have been within the child's experience.	Introduction prior to p. 6, number 1. Succeeding examples: p. 7, number 5; p. 8, number 6; p. 9, number 2; p. 12, number 1; p. 13, number 9; p. 16, number 4.
6.	Rhythm[f]	Rhythm is the order of motion. It is composed of both note duration values and	The degree of generalizability is limited by not only the child's concept of rhythm but	p. 7, number 5; p. 9, number 2; p. 9, number 5; p. 10, numbers 2,3; p. 11,

Concept	Understandings (in the vocabulary of the teacher)	Generalizability	Introductory Location in First Division
	regular metrical pulsation.	also by the development of his physical coordination.	number 2; p. 12, number 4; p. 13, numbers 4,5; p. 14, number 6.
7. Phrase[g]	Phrases are the sentences of music. All playing must be done in phrases. Phrases, for the beginner, are the notes played between breaths in regular patterns.	Correct phrasing is as much a matter of habit as it is of phrase-length recognition. Therefore, it can be generalized.	p. 6, number 4; p. 7, number 2; p. 7, number 8; p. 8, number 3. Phrase every exercise.

Antecedent variates. As with most disciplines, the quality, methodology, and degree of accomplishment of general music programs in the elementary school vary widely. Consequently, it was difficult, descriptively, to analyze the common musical backgrounds resulting from pupils' general music experience. Therefore, the following abilities, relating to the seven characterized concepts and which are recommended accomplishments in standard general music textbooks for fifth-graders, may or may not have been attained by all prospective instrumental beginners.

1. Physical design of the instrument. Through the texts of songs, pictures, mock-ups, and recordings, pupils have some acquaintance with families of instruments and can identify general characteristics of design and sound of some instruments.

2. Tone production. Fifth-graders can identify most instruments of the band as being wind or percussion instruments; they can identify some single and double reed instruments and some cup-mouthpiece instruments by sight and sound; and from films, filmstrips, and pictures have a limited knowledge of playing position.

3. Ideal tone quality. From other resources in their environments and from general music classes, fifth-graders can identify the extremes of good and bad tone quality, but seldom the gradations between.

4. Intervallic relationships. The fifth-grader commonly can: (1) identify melodic direction and step-skip tonal movement in musical notation, (2) identify scale-line and chord-line patterns within musical contexts, (3) use number, letter, or syllable names in identification of intervals in performing and creating (in the treble clef), (4) identify same-different tonal patterns, and (5) has had some experience in writing of intervals.

5. Correct note lengths. The fifth-grader should: (1) identify even-uneven rhythmic patterns in notation, (2) interpret notation of a 2 to 1 relationship (as in two quarter-notes equalling a half-note) and notation of a 3 to 1 relationship, and (3) interpret meter signatures.

6. Rhythm. The general-music pupil at this level can maintain a regular pulsation of tapping or clapping when such does not involve other muscular movements, and he has some comprehension of the relative relationship in rhythmic values.

7. Phrasing. A common chief exposure through general music to phrasing is through body rhythm (moving hands up and across the body in imitation of phrase lines, for example) and through the bracketing technique of start and end of phrase. The pupil also has had some strong beginnings in the form of music (of which the phrase is the fundamental component) through identification of many idioms from one- and two-part song forms to the rondo form.

Facsimiles of test instruments. Because of the fact that they are auditory, largely non-verbal measures; are standard, published materials; and because of the bulk that each entails, the Colwell Elementary Music Achievement Test, the Gordon Musical Aptitude Profile, and the Watkins-Farnum Performance Scale were not reproduced in the APPENDIX of this report. Clearance was sought and given by the Bureau of Research for the Performance Scale; a copy of this clearance may be found in the APPENDIX, p. 33.

CHAPTER III

FINDINGS AND ANALYSIS

Analyses of samples. In the original projection by the cooperating teachers in this study, there were a total of 335 pupils planned to be part of the investigation: 172 in the experimental groups and 163 in the control. Actually starting in the program, however, were 312: 160 in experimental groups and 152 in control. From these, there were a total of 59 in experimental mortality, 42 in control schools, and 17 in experimental classes, leaving a total N=253: 143 in experimental and 110 in control classes.

Teachers were asked to count as mortalities any pupils who were absent the day any test was given because the resultant learning which could have taken place by the time the absent student made up the test could have affected his test score. Illness, the major factor in mortalities as reported by the cooperating teachers, seemed due primarily to the high incidence of "Hong Kong" flu which swept the country during the time of the posttests in December, 1968. The second cause of experimental mortality was pupils' moving to other communities. Actual dropouts from both groups totaled only 5, of which 3 were from control situations and 2 were from experimental.

Both experimental and control groups seemed normally distributed for beginning classes. Mean I.Q.'s for experimental classes were 111.37 and 113.51 for control. (One would normally expect beginning classes to be made up of normal and upper intelligence groups.) There were 131 boys and 122 girls in the total N=253; there were 57 boys and 53 girls in control groups and 74 boys and 69 girls in experimental.

The experimental grand mean standard score of 46.87 and the control group mean standard score of 47.62 on the Musical Aptitude Profile would constitute the 50th and 55th percentiles, respectively, on percentile norms for fifth-grade pupils nationally (derived from the Musical Aptitude Profile Manual). There were no statistically significant differences between the two groups on Musical Aptitude Profile scores.

In the test Manual, Experimental Edition, of the Elementary Music Achievement Test, norms were not given.

However, the test editor, Richard Colwell, indicated that a raw score total of 50 was intended to be a mean. Thus, the pretest grand means of 44.81 for the experimental group and 46.96 for the control and the posttest grand means of 50.30 for the experimental and 52.03 for the control would indicate that both groups were approximately normally distributed on the criterion of background experience in general music with the control scoring slightly higher on this criterion, both times, than the experimental group. A significant difference between the two groups on the pre-test administration was found, but not on the posttest administration of the same instrument.

The variables with limited controls of motivation of pupils, strengths and weaknesses of total individual school music programs, and financial wealth of individuals and school districts appeared, with no validation other than observation, to be normally distributed. While some extremes on each such variable were noted, they tended to cancel each other through randomization.

Analyses of teacher effectiveness. As mentioned in Chapter II, the Johnson Evaluation of Teacher Ability was used in this research to explain differences in class achievements not otherwise explainable through data-processing outcomes. Teaching effectiveness is defined here as resultant change in pupil behaviors. The Johnson instrument is divided into four major sections: Effect of Teacher on Class, Reaction to Environment, Adequacy of Student, and Outcomes of General Experience. Effect of Teacher on Class may be rated 1 to 5 on each subcategory of appearance, voice, English usage, mannerisms, general vigor and enthusiasm, poise, emotional stability, competency in subject area, and physical climate. Reaction to Environment (of class to teacher) may be rated from 1 to 5. Adequacy of Student may be rated 1 to 5 with all control by the teacher of from 5 to 1 with no control by the teacher. Outcome of General Experience is rated 1 to 10, the rating of which is a total of the ratings given Reaction to Environment and Adequacy of Student. While Frames of Reference were given for scoring, no indications were given how to determine a final point value. For this experiment, the Investigator simply added the total raw score point values for each teacher. Each teacher was visited 3 times for a full period and a mean from these three visits was determined for each teacher.

Using this system, the maximum point value obtainable was 65 for any teacher and the minimum was 12. The median rating for all teachers was 46.49, Q_3 was 53.16, and Q_1 was 38.83. The range of ratings given was from 30.33 to 57. In the fourth quartile were 3 experimental teachers and one control teacher (although the one control teacher was rated

most effective of all teachers); in the third quartile were 3 experimental teachers and 2 control; in the second quartile were 2 experimental and 2 control teachers; and in the 1st quartile were 1 experimental teacher and 4 control. Thus, there were 6 experimental teachers above the median, while 3 were below; the converse situation occurred with control teachers: 3 above the median and 6 below. A copy of the ratings may be found in the APPENDIX, p. 37.

One would normally expect, then, if growth in individual pupil behaviors (attainments) is commensurate with teacher effectiveness, the growth of the experimental groups should be greater than those of control groups. Analysis of this, in terms of some individual schools, follows later in this chapter following analyses from data processing.

Analyses from data processing. On the advice of two statistical experts on the University of Wyoming campus, analysis of variance rather than analysis of covariance was used in the interpretation of the data for hypotheses 1, 3, 7. It was their opinion that if controls were adequate through variance, then the further refinement afforded through covariance would be unnecessary. Analysis of hypothesis 2 was done with t test, while analysis of 4, 5, and 6 was accomplished through analysis of covariance.

Hypothesis 1 that: there will be no significant differences between the grand means of the experimental and control groups on the Watkins-Farnum Performance Scale posttest scores at Alpha level .05 was rejected. The grand mean of the experimental group was 21.36 and for the control 13.32. The F value was 35.576 for the .05 level at 3.86. It would have been significant beyond the .001 level, which required a F value of 10.83. In main effect, the F value for size tested was 9.908. One interaction was tested in this hypothesis: in size and treatment, there was the least difference in these posttest scores between the experimental (20.168) and control (19.001) groups in the large schools, and there was the greatest difference between the experimental (26.340) and control (15.210) in the middle-sized schools. (See APPENDIX, p. 26)

Hypothesis 2 that: there will be no significant differences between the grand means of the posttest scores of the experimental and control groups for each type of instrument at Alpha level .05 was rejected for flutes, clarinets, cornets and trumpets, and drums. It failed to be rejected for saxophones, horns, trombones, and baritones. Too few basses were involved in the experiment for analysis. Using a two-tail test, flutes had a t score of 2.15 at a t level of 2.03, clarinets a 2.93 t score at 2.00 level, cornets and trumpets a 3.48 at 2.00 level, and drums a t score of 2.95 at 2.06 level. (See APPENDIX, p. 27)

Hypothesis 3 that: there will be no significant differences between the grand means of the posttest scores of the experimental and control groups for each sex at Alpha level .05 failed to be rejected. The F value was 0.465 and the F value would have been significant at 3.86. (See APPENDIX, p. 28)

Hypothesis 4 that: there will be no significant differences between the grand means of differences between the means of the Musical Aptitude Profile scores and their corresponding Watkins-Farnum Performance Scale was rejected. The F value for treatment was 44.445 which was significant for 1 and 247 d.f. at 3.89. Size (.167), treatment and size (.0181), and regression (1.846) were not significant at $F_{1,247}=3.89$ and $F_{2,247}=3.04$. The adjusted mean of the experimental groups was 21.537 and for control 13.233 on the Watkins-Farnum test. In main effect, the high 1/3 of pupils on the pretest instrument had an adjusted mean of 18.202 on the posttest, and middle 1/3 on the MAP had an adjusted mean on the posttest of 17.422, and the low 1/3 of pupils on the MAP adjusted mean score was 16.540. Although interaction of treatment and size was not significant, the high and middle one-thirds of pupils on the MAP did better by experimental methods on the Watkins-Farnum (17.514 and 17.233) than did the control (17.256 and 17.537). The lower one-third accomplished more, on an adjusted basis, by control methods (17.537) than by experimental (17.233). (See FIGURE 4, p. 29)

Hypothesis 5 that: there will be no significant differences between the grand means of differences between means of the Elementary Music Achievement Test pretest scores and their corresponding Watkins-Farnum Performance Scale posttest scores for the lower, middle, and upper 1/3 Elementary Music Achievement Test pretest scores for the experimental and control groups at Alpha level .05 was rejected. The F value for treatment was 35.858 which was significant for 1 and 247 d.f. at 3.89. Size (.459), treatment and size (1.048), and regression (1.048) were not significant at $F_{1,247}=3.89$ and $F_{2,247}=3.04$. The adjusted means were 13.195 for control schools on the Watkins-Farnum test and 21.421 for the experimental. In main effect, the high 1/3 of pupils on the pretest instrument had an adjusted Watkins-Farnum mean of 17.699, the middle 1/3 an adjusted mean of 18.013, and the lower 1/3 on the pretest a posttest mean of 16.212 on the Watkins-Farnum. Although interaction of size and treatment was not significant, experimental schools with pupils scoring on the top 1/3 on the EMAT scored 17.314 on the Watkins-Farnum compared with control schools in the top 1/3 on the EMAT who scored 17.302. Pupils from experimental schools scoring in the middle 1/3 on the EMAT pretest instrument also showed greater achievement than did control on the Watkins-Farnum, 18.435 compared with 16.181. Only in the

lower 1/3 of pupils on the pretest instrument did pupils from control situations surpass experimental pupils on the posttest, 18.429 compared with 16.187. (See FIGURE 5, p. 30)

Hypothesis 6 that: there will be no significant differences between the grand means of differences between the means of the I.Q. scores and their corresponding Watkins-Farnum Performance Scale posttest scores for the lower, middle, and upper 1/3 I.Q. scores of the experimental and control groups at Alpha level .05 was rejected. The F value for treatment was 38.264 which was significant for 1 and 230 d.f. at 3.89. The adjusted means of the experimental schools was 21.820 and for control 13.460 on the Watkins-Farnum. Size (2.484) and treatment and size (.830) were not significant at $F_{1,230}=3.89$ and $F_{2,230}=3.04$. Regression (13.150) was significant at 3.89. The adjusted (on I.Q.) mean of all experimental pupils was 21.820 on the Watkins-Farnum and 13.460 for control pupils. In main effect, the high 1/3 of pupils in I.Q. had an adjusted mean on the Watkins-Farnum of 14.729, the middle 1/3 a mean of 16.899, and the lower 1/3 in I.Q. an adjusted mean of 21.292, indicating that under either method of instruction the greatest gains were made by the lower I.Q. pupils, and that the least gains were made by the higher I.Q. pupils. Although interaction of size and treatment was not significant, pupils in the middle and lower one-thirds on the I.Q. measurement achieved more under experimental treatments (17.684 and 18.694) than did pupils under traditional methods (17.596 and 16.586). Pupils in the top 1/3 in I.Q. made higher scores on the Watkins-Farnum by traditional methods (18.738) than by experimental (16.542). (See FIGURE 6, p. 31)

Hypothesis 7 that: there will be no significant differences between the grand means of the experimental and control groups on the pre and posttest administrations of the Elementary Music Achievement Test at Alpha level .05 failed to be rejected. The F value was 0.763 where the F value was significant at 3.86. In main effect, the F value for size tested was 9.116 where the F value was significant at 3.02. Two interactions occurred. In state and size, the greatest mean gains were in middle-sized schools in Colorado, while the least mean gains were in large schools in Wyoming. In size and sex, boys in middle-size schools made the greatest gains (10.024), while the least gains were made by boys in large schools (2.076). (See APPENDIX, p. 32)

Teacher effectiveness and hypotheses outcomes. As was discussed earlier in this report, the Johnson Evaluation of Teacher Ability was used in this experiment to account for the variable of teacher effectiveness in terms of outcomes. Prior statistical evidence concerning this instrument indicated that it had an r of interrelationships on parts of the

instrument of .734 significant at the .01 level, a coefficient of reliability of r=.9075, a reliability of test r= .911, relationship to Rorschack signs of r=.605, and a multiple r of .819. In this present research, a Pearson r= .964 with Watkins-Farnum scores was found, which was significant at the .01 level with 18 degrees of freedom. This extremely high relationship was believed by the Investigator to be due to that fact that teacher evaluation ratings did not seem causal of class achievements but direct reflections of pupil progress.

Because the Pearson r indicated a significant correlation between the two factors, an analysis of covariance between the two was devised, but was not reported in this document because one of the two statistical experts consulted by the Investigator felt this to be a weaker, not as effective measure, while he felt the other, included measures to be much stronger. This was primarily due to sample size (18) of this analysis compared to the others (254). The emergent data, however, were consonant with others reported.

In terms of interpretation, teacher analyses could only be made in reference to the first hypothesis. Large schools had a least-squares mean for size of 19.585, middle-sized schools 20.776, and small schools 14.284. If all teachers were equally effective, one would look for these to be approximately similar. However, among the 9 teachers rated most effective, four of them were from large schools and 2 from medium-sized. The four large schools had a mean of 19.27 on the Watkins-Farnum while the two medium sized had a mean of 29.33. Three of the small-school teachers were rated in the most effective half and had a mean posttest score of 19.09. Consequently, in both data processing and teacher evaluation, middle-sized schools proved most effective.

In size and treatment, middle-sized schools showed the highest mean on the Watkins-Farnum scores at 26.340. Teachers from two middle-sized experimental schools were among the first four teachers as rated in teacher effectiveness with a Watkins-Farnum mean of 29.49 for their pupils, where the mean for all pupils was 17.82 on this instrument. Small control schools had the lowest mean posttest scores at 9.327. Only one small control school was in the lower half of the 18 teachers as rated for teacher effectiveness, but he was rated 17th of the 18 teachers and showed the lowest Watkins-Farnum mean score, 3.19, of all teachers. For the two schools representing a middle position, large control schools had an adjusted mean rating of 19.001 while middle-sized schools had a rating of 15.210. Large control schools represented the entire range of measurement of teacher effectiveness with a 1st and 18th position in terms of teacher rating; the third large school was in approximately the middle, or 11th position, among all schools. These 3 had a

mean on the posttest instrument of 19.36, which was approximately at the middle of all Watkins-Farnum posttest scores. Two of the three middle-sized control schools were in the third quartile of teacher ratings, while 1 was in the top of the fourth quartile. In terms of their Watkins-Farnum posttest scores, they had a mean of 17.04, which was in the third quartile of posttest scores.

FINDINGS

1. With a grand mean for experimental schools of 21.36 on the Watkins-Farnum posttest instrument and 13.32 for control schools, experimental schools showed a definite difference in musical achievement over control (significant beyond the .001 level).

2. Upper woodwinds and brass instruments and drums were more successfully taught by experimental than control methods (significant t scores). There is no significant difference between either method in teaching low woodwinds and brasses (non-significant t scores).

3. There was no statistically significant difference between either sex for learning instrumental music at the beginning stage through either control or experimental methods (F value of .0465 significant at 3.86).

4. High and average pupils in musical aptitude gained more in performance skill through experimental methods than through control methods. (17.514 and 17.408 compared to 17.256 and 17.363, adjusted values).

5. High and average pupils in musical achievement gained more in performance skill through experimental methods than through control methods (17.314 and 18.435 compared with 17.302 and 16.181). Pupils relatively low in musical achievement gained more in performance skill through control methods. (18.429 compared to 16.187). (All are adjusted values)

6. Pupils high in I.Q. made higher adjusted scores on the Watkins-Farnum instrument by traditional methods than by the experimental (18.738 compared to 16.542). Average and low pupils in I.Q. made higher scores on the posttest (17.684 and 18.694) by experimental methods than by control (17.596 and 16.586). (All are values adjusted on I.Q.)

7. The retest of the Elementary Music Achievement Test failed to show any significant differences in terms

of gains between the control and experimental methods of teaching.

8. There was no evidence of a Hawthorne effect as a contaminating effect in experimental classes. All visits to all classes indicated an equality of effort on the part of all teachers and pupils.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

On the basis of the evidence from this research, the following conclusions appear warranted:

1. The concept approach to teaching beginning band pupils is superior to traditional teaching methods in the development of performance skills for all pupils taken as a whole.

2. The concept approach is superior to present methods for teaching upper woodwinds, upper brass instruments, and drums. Low woodwinds and low brass make progress equally under either teaching method.

3. The concept approach is equally effective for boys and for girls.

4. Pupils high and average in musical aptitude will gain more in performance skills through concept approaches than through traditional teaching methods. Pupils relatively low in musical aptitude will gain more performance skill through traditional processes.

5. Pupils high and average in musical achievement, learned from general music classes and other previous musical experiences, will gain more in performance skill through concept teaching than through traditional teaching methods. Pupils relatively low in musical achievement will gain more in performance skill through traditional teaching than through concept approaches.

6. Pupils high in intelligence as measured by I.Q. tests will gain more in performance skill through traditional teaching methods than through concept teaching. Pupils average and relatively low in measured intelligence gain more through the concept approach than through traditional teaching. In light of conclusions 4 and 5 preceding, some doubt may exist that standard verbal measures of intelligence adequately measure music-performance intelligence.

7. While the concept approach to teaching beginning band pupils proved superior to traditional teaching methods in the development of music-performance skills, there is no apparent advantage to either method in the development of aural-discrimination skills.

8. Because of the pre-experimental measures' indicating a normal distribution of pupils in the sample and the high correlation of the measurement of teacher effectiveness to learning outcomes, the Investigator concludes that the results of this study can be generalized to American fifth-grade band classes in other schools with similar population characteristics.

RECOMMENDATIONS

1. This study should be repeated with the same pupils within a two-year period for a more-longitudinal study of the effects of concept teaching.

2. A major music publisher should produce a beginning band instruction book based on concept approaches for use in similar classes.

3. The results of this study should be implemented by college teachers of instrumental teaching-methods classes as an inculcation in American schools.

4. All forms of appropriate media, such as music research seminars at divisional conferences of Music Educators National Conference, publications in state and national music periodicals, and televised class rehearsals, should be utilized to encourage wide-scale tryout of concept teaching in instrumental music.

5. The study should be repeated with junior high and high school bands and orchestras to see if similar results can be obtained at two other learning levels and both intrumental-music media.

SUPPLEMENTARY AND APPENDIX MATERIALS

FIGURE 1

EXTRACTIONS FROM DATA PROCESSING, ANALYSIS OF VARIANCE, HYPOTHESIS I

Source of Variation	d.f.	Sum of Squares	Mean Squares	F Value
SIZE	2	1625.681	812.841	9.908
TREATMENT	1	2918.521	2918.521	35.577
SIZE X TREATMENT	2	1038.126	519.063	6.327

Constants and Means for Size X Treatment

Size	Treatment	Constant	Mean
1	1	.359	18.808
1	2	.359	20.361
2	1	.403	19.955
2	2	.403	21.596
3	1	.763	14.629
3	2	.763	13.938

FIGURE 2

t TEST ANALYSIS OF HYPOTHESIS II

Instrument	d.f.	t Level	t Score	Significance
Flutes	34	2.030	2.15	significant
Saxophones	19	2.093	1.58	non-significant
Cornets and trumpets	60	2.000	3.48	significant
Horns	6	2.447	1.66	non-significant
Drums	25	2.060	2.95	significant
Trombones	19	2.093	1.41	non-significant
Clarinets	58	2.000	2.93	significant
Baritones	6	2.447	1.89	non-significant

FIGURE 3

EXTRACTIONS FROM DATA PROCESSING, ANALYSIS OF VARIANCE, HYPOTHESIS III

Source of Variation	d.f.	Sum of Squares	Mean Squares	F Value
SEX	1	38.179	38.179	0.465

Constants, Least-Squares Means, and Standard Error of Least-Square Means for SEX

Constant		Least-Squares Mean	Standard Error
Boys	-0.417	17.798	0.854
Girls	-0.417	18.632	0.888

FIGURE 4

EXTRACTIONS FROM DATA PROCESSING, ANALYSIS OF COVARIANCE, HYPOTHESIS IV

Source	d.f.	Corrected S.S.	M.S.S.	F
TREATMENT	1	4,266.559	4,266.559	44.445
SIZE	2	31.971	15.989	.167
TRT X SIZE	2	3.432	1.716	.018
REGRESSION	1	177.202	177.202	1.846
ERROR	247	23,710.895	95.996	

MEANS

TRT.	1	13.233	SIZE 1	18.202
			SIZE 2	17.422
TRT.	2	21.537	SIZE 3	16.540

TREATMENT X SIZE

	SIZE 1	SIZE 2	SIZE 3
TRT. 1	17.256	17.362	17.537
TRT. 2	17.514	17.408	17.233

FIGURE 5

EXTRACTIONS FROM DATA PROCESSING, ANALYSIS OF COVARIANCE, HYPOTHESIS V

Source	d.f.	Corrected S.S.	M.S.S.	F
TREATMENT	1	3,833.543	3,833.543	35.858
SIZE	2	90.521	45.260	.459
TRT. X SIZE	2	206.835	103.418	1.048
REGRESSION	1	17.672	17.672	.179
ERROR	247	24,368.079	98.656	

MEANS

TRT.	1	13.195	SIZE 1	17.699
			SIZE 2	18.013
TRT.	2	21.421	SIZE 3	16.212

TREATMENT X SIZE

		SIZE 1	SIZE 2	SIZE 3
TRT.	1	17.302	16.181	18.429
TRT.	2	17.314	18.435	16.187

FIGURE 6

EXTRACTIONS FROM DATA PROCESSING, ANALYSIS OF COVARIANCE, HYPOTHESIS VI

Source	d.f.	Corrected S.S.	M.S.S.	F
TREATMENT	1	3,769.742	3,796.742	38.264
SIZE	2	489.531	244.766	2.484
TRT. X SIZE	2	163.548	81.774	.830
REGRESSION	1	1,295.504	1,295.504	13.151
ERROR	230	22,659.370	98.519	

MEANS

TRT. 1	13.460	SIZE 1	14.729
		SIZE 2	16.899
TRT. 2	21.820	SIZE 3	21.292

TREATMENT X SIZE

	SIZE 1	SIZE 2	SIZE 3
TRT. 1	18.738	17.596	16.586
TRT. 2	16.542	17.684	18.694

FIGURE 7

EXTRACTIONS FROM DATA PROCESSING, ANALYSIS OF VARIANCE, HYPOTHESIS VII

Source of Variation	d.f.	Sum of Squares	Mean Squares	F Value
SIZE	2	1325.805	662.902	9.116
TREATMENT	1	55.475	55.475	0.763
STATE X SIZE	4	2254.000	563.500	7.749
SIZE X SEX	2	495.494	247.747	3.407

Constants and Means for State X Size

State	Size	Constant	Mean
1	1	4.514	7.121
1	2	-5.823	3.010
1	3	1.309	7.233
2	1	-3.614	-1.391
2	2	2.376	11.726
2	3	0.339	5.879
3	1	-0.900	2.984
3	2	2.548	12.660
3	3	-1.648	5.553

Constants and Means for Size X Sex

Size	Sex	Constant	Mean
1	1	0.071	2.076
1	2	-0.071	3.734
2	1	1.791	10.024
2	2	-1.791	8.240
3	1	-1.862	3.460
3	2	1.862	8.983

FIGURE 8

COPY OF CLEARANCE OF PERFORMANCE SCALE

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
BUREAU OF RESEARCH

To: SEE BELOW

Date: December 18, 1968
(Contacted by phone)

FROM: Herbert S. Conrad, Chairman
Internal Clearance Committee

SUBJECT: Clearance of performance scale submitted for use in the extramural research project entitled "A PILOT EXPERIMENTAL STUDY OF CONCEPT TEACHING IN ELEMENTARY SCHOOL BEGINNING BANDS." College of Education, University of Wyoming, Laramie (OEG-8-9-090002-2014 (057).

The purpose of this project is in line with the title stated above.

The WATKINS-FARNUM PERFORMANCE SCALE has been reported for clearance prior to use in the above named project. Est. respondent-time, 15 min. "This performance scale is currently the only standardized measure of performance ability in instrumental music." Respondents will include 335 fifth graders (randomly selected) from 18 schools in the States of Montana, Wyoming, and Colorado.

Respondent's name is requested, but will be later transferred to a code number.

The scale is hereby cleared for use in this project.

COPIES TO: Prin. Inv'gator
Dr. Conrad
Dr. Crum
Dr. Messier
Mr. Hochstein
Mr. Cook
Reading file
HSCONRAD:meh

CONCURRENCE (12/18/68):

H. S. Conrad
SS

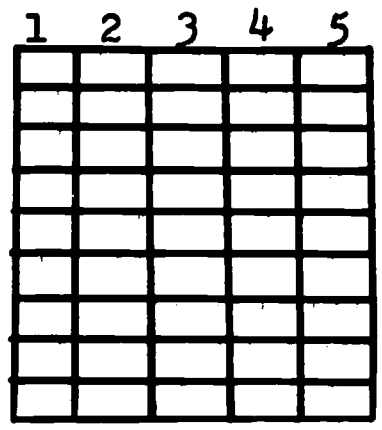
Paul R. Messier
SS

Lewis R. Crum
SS

FIGURE 9

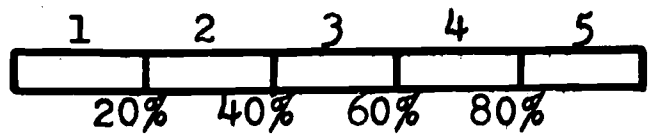
FACSIMILE OF INSTRUMENT FOR EVALUATION OF TEACHER ABILITY
DEVELOPED BY DR. GRANVILLE B. JOHNSON, JR.

I. Effect of Teacher on Class (Effect of Environment)

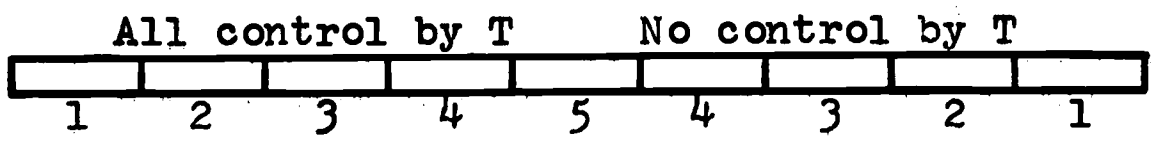


Appearance (physical and dress)
Voice
English usage
Mannerisms (absence)
General vigor and enthusiasm
Poise
Emotional stability
Competency in subject area
Physical climate

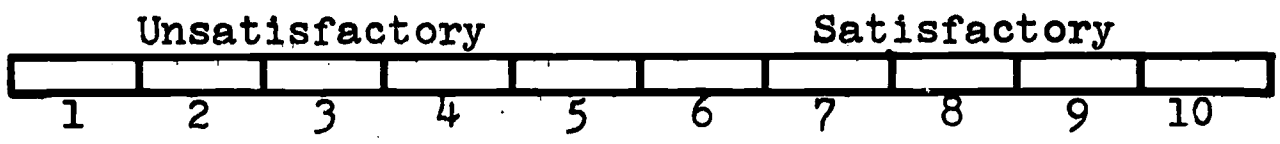
II. Reaction to Environment (of class to teacher)



III. Adequacy of Student



IV. Outcome of General Experience



FRAME OF REFERENCE

Scoring

I. Effect of Environment

This includes all aspects of environment set up by the teacher in the classroom.

A rating of 5 would be:

Appearance	Nothing about face or body to be a distraction from learning. Well groomed.

Voice	Well modulated, normal pitch, timbre, volume well controlled. Teacher can be heard and understood by students.
English usage	Correct grammar and correct choice of words. Pronunciation and enunciation are correct and clear.
Mannerisms	Free from distracting idiosyncracies. These would include any word or action repeatedly used.
General vigor, enthusiasm	Interest in classroom situation. Manifested by voice, posture, expression.
Poise	General demeanor in all normal situations. Confidence and ease in handling classroom situation.
Emotional stability	Manifested by teacher's reaction to emotion provoking situations. Also, emotional reaction to ordinary classroom incidents.
Competency in subject areas	Only graded when there is significant indication that the teacher is not well informed about subject.
Physical climate	Teacher controlled physical aspects of classroom conducive to learning, e.g. books, pictures, light, temperature.

Each five minutes, the classroom situation was adjudged for each category where there was evidence. If a critical incident occurred, the five-minute period limit was disregarded.

II. Reaction to Environment (of class to teacher)

Graded according to percent of students who are apparently attentive. The students motivation may be either intr[illegible] or extrinsic. Here, all that is looked for is e[illegible]ce of attention.

III. Adequacy of Student

Grade:

1. Teacher attempts to subjugate student to her will. She may or may not be successful.

5. The teacher leads but gives credence to student needs and interests. Highest rapport here. There is a balance of control between students and teacher.

1. Teacher allows students complete control of the situation--no leadership shown.

IV. Outcome of General Experience

Add II and III together. If the student is attentive and there is a balance between student and teacher control, intrinsic motivation may be assumed. In this situation, self direction is also inferred. The higher the sum of II and III, the greater the student's attitude for positive self direction.

FIGURE 10

MEANS AND RANK ORDERS OF TEACHER RATINGS

TEACHER AND GROUP	SCHOOL SIZE	RATING 1	RATING 2	RATING 3	$\bar{X}$	RO
A-C	LARGE	56	59	56	57	1
B-X	MEDIUM	56	57	52	55	2
C-X	LARGE	55	52	55	54	3
D-X	MEDIUM	55	51	55	53.66	4
E-X	LARGE	52	54	52	52.66	5
F-C	SMALL	54	51	52	52.33	6
G-X	LARGE	49	47	48	48	7
H-C	SMALL	45	51	48	48	8
I-X	SMALL	46	52	45	47.66	9
J-C	MEDIUM	44	49	43	45.33	10
K-C	LARGE	46	46	41	44.33	11
L-X	MEDIUM	40	44	42	42	12
M-X	SMALL	42	42	40	41.33	13
N-C	MEDIUM	34	39	36	36.33	14
O-C	MEDIUM	42	35	31	36	15
P-X	SMALL	38	35	32	35	16
Q-C	SMALL	34	33	26	31	17
R-C	LARGE	31	33	27	30.33	18

$Me=46.49$
$Q_3=53.16$
$Q_1=38.83$

FIGURE 11

ACCUMULATED VALUES AND RESULTANT MEANS
FOR NINE EXPERIMENTAL CLASSES

N	IQ	SEX M	SEX F	MAP	EMAT1	EMAT2	WF	+EMAT
26	2860	13	13	1285	1171	1236	516	65
16	1784	13	3	776	660	754	349	102
16	1796	8	8	790	652	813	386	161
14	1613	4	10	670	822	871	269	61
15	1686	5	10	688	572	586	349	24
12	1349	9	3	516	524	553	211	29
20	2306	10	10	855	921	1182	442	261
7	759	5	2	356	310	415	250	105
17	1793	7	10	766	719	783	283	64
143 Totals	15946	74	69	6702	6351	7193	3055	872
$\bar{X}$	111.37			46.87	44.41	50.30	21.36	6.09

FIGURE 12

COPY OF PERMISSION LETTER TO USE INSTRUMENT FOR EVALUATION OF TEACHER ABILITY IN THIS RESEARCH PROJECT

UNIVERSITY OF SOUTH ALABAMA

COLLEGE OF EDUCATION Mobile, Alabama 36608

January 7, 1969

Dr. Robert F. Noble
Assoc. Professor of Music Education
and Educational Foundations
College of Education
University of Wyoming
Laramie, Wyoming 82070

Dear Dr. Noble:

I am glad that you intend to revive this instrument because I have felt that it had unexplored potential.

Please keep me informed of your progress.

Sincerely,

Granville B. Johnson, Jr.
Professor, Educational
Psychology
SS

GBL:lb

FIGURE 13

ACCUMULATED VALUES AND RESULTANT MEANS
FOR NINE CONTROL CLASSES

N	IQ	SEX M	SEX F	MAP	EMAT1	EMAT2	WF	+EMAT
10	1131	6	4	480	492	530	240	38
16	1772	13	3	703	749	826	51	68
17	NA	10	7	842	831	959	161	129
21	2381	7	14	982	905	965	261	72
10	1125	6	4	520	457	539	199	92
14	1608	6	8	687	583	636	183	53
14	1595	4	10	646	702	877	192	165
2	221	2	0	107	107	113	52	6
6	723	3	3	271	339	278	126	-57
110 Totals	10556	57	53	5238	5165	5723	1465	566
$\bar{X}$	113.51			47.62	46.96	52.03	13.32	5.15

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